

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 01 OCT 2004

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference 030036U2WO		Date of mailing (day/month/year) 29 SEP 2004
FOR FURTHER ACTION See paragraph 2 below		
International application No. PCT/US04/13203	International filing date (day/month/year) 30 April 2004 (30.04.2004)	Priority date (day/month/year) 05 April 2004 (05.04.2004)
International Patent Classification (IPC) or both national classification and IPC IPC(7): G01S 5/02; H04B 7/185 and US Cl.: 455/ 11.1-13.2, 427, 456.1-456.6; 342/352-353, 357.01, 357.08, 357.09, 357.1, 357.12		
Applicant QUALCOMM INCORPORATED		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>NONE</u>	YES
	Claims <u>1-18, 20-29</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-18, 20-29</u>	NO
Industrial applicability (IA)	Claims <u>1-18, 20-29</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Please See Continuation Sheet

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims 1-18, 20-29 are objected to because of the following informalities: claim 19 is missing and / or numbering of claims are out of sequence. PCT Rule 6.1 (b) requires if there are several claims, they shall be numbered consecutively in Arabic numeral. Appropriate correction is required.

Claim 29 is objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claim 29 indefinite for the following reason(s): claim 29 is depended on itself and is unclear what that claim invention stands for.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

Claims 1-18, 20-29 lack novelty under PCT Article 33(2) as being anticipated by Amerga (US 2002/0115448 A1).

With respect to claim 1, Amerga discloses a repeater of a wireless communication system (See e.g. 130, 120, 124a-124c, 104a-104c, 114a-114c of Fig. 1, Page 2, Paragraphs [0032]-[0035]) comprising: repeating circuitry to receive a signal sent from a first device in the wireless communication system and repeat the signal to a second device in the wireless communication system (See e.g. Page 5, Paragraphs [0064]-[0065]); and a positioning unit to receive; positioning signals and calculate a position of the repeater based on the positioning signals (See e.g. Page 5, Paragraphs [0064]-[0065]) / indicative of a location of the repeater (See e.g. Page 6, Paragraph [0080]).

Regarding claim 2, Amerga discloses the positioning signals comprise satellite positioning signals received from positioning satellites and the positioning unit comprises a global positioning system (GPS) receiver (See e.g. Page 8, Paragraphs [0101]-[0104], Page 11, Paragraphs [0135]-[0137]).

Regarding claim 3, Amerga discloses the repeater receives the signal from the first device via a physical transmission line and repeats the signal to the second device via a wireless link (See e.g. Page 6, Paragraph [0075]).

Regarding claim 4, Amerga discloses the repeater receives the signal from the first device via a physical transmission line and repeats the signal to the second device via a wireless link (See e.g. Page 6, Paragraph [0075]).

Regarding claim 6, Amerga discloses receiving information indicative of signals detected by a subscriber unit of the wireless communication system; and generating position assistance information based on the positioning information received from the repeater and the information indicative of signals detected by the subscriber unit (See e.g. Page 6, Paragraph [0080]-[0082]).

Regarding claim 7, Amerga discloses sending the position assistance information to the subscriber unit (See e.g. Page 9, Paragraph [0108]).

Regarding claim 8, Amerga discloses the position assistance information identifies a set of positioning system satellites (See e.g. 124a-124c of Fig. 1) that are in view to the subscriber unit (See e.g. Page 6, Paragraph [0080]-[0082]).

Regarding claim 9, Amerga discloses the information indicative of signals detected by the subscriber unit includes phase offsets, and the signals are associated with base stations of the wireless communication system (See e.g. Page 2, Paragraph [0036], Page 3, Paragraph [0042]).

Regarding claim 10, Amerga discloses receiving positioning information for a receiving device; receiving positioning information for a sending device; receiving observed information indicative of signals sent from the

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

sending device to the receiving device (See e.g. Page 5, Paragraphs [0064]-[0065]); and calculating a repeater delay for signals sent from the sending device to the receiving device through the repeater based on the positioning information for the repeater, the positioning information for the receiving device, the positioning information for the sending device, and the observed information (See e.g. Page 5, Paragraph [0071] - Page 6, Paragraph [0074]).

Regarding claim 11, Amerga discloses identifying a predicted delay based on distances between the sending device and the repeater and the repeater and the receiving device; identifying an observed delay from the observed information; and calculating the repeater delay as a difference between the observed delay and the predicted delay (See e.g. Page 6, Paragraphs [0076]-[0081]).

Regarding claim 12 Amerga discloses identifying the observed delay includes identifying from the observed information a phase offset of pilot symbols relative to system time associated with the wireless communication system (See e.g. Page 6, Paragraphs [0076]-[0081]).

Regarding claim 13 Amerga discloses a receiver to receive positioning information for a repeater of a wireless communication system indicative of a location of the repeater and to receive information indicative of signals detected by the subscriber unit; and a position assistance unit to generate position assistance information based on the positioning information for the repeater and the information indicative of signals detected by the subscriber unit (See e.g. Page 6, Paragraphs [0080]-[0081], Page 11, Paragraphs [0135]-[0136]).

Regarding claim 14 Amerga discloses a transmitter to send the position assistance information to the subscriber unit (See e.g. Page 6, Paragraphs [0080]-[0081], Page 11, Paragraphs [0135]-[0136]).

Regarding claim 15 Amerga discloses the position assistance information identifies a set of positioning system satellites that are in view to the subscriber unit (See e.g. Page 6, Paragraphs [0080]-[0081], Page 11, Paragraphs [0135]-[0136]).

Regarding claim 16 Amerga discloses the information indicative of signals detected by the subscriber unit includes phase offsets, wherein the signals are associated with base stations of the wireless communication system (See e.g. Page 6, Paragraphs [0080]-[0081], Page 11, Paragraphs [0135]-[0136]).

With respect to claim 17, Amerga discloses device of a wireless communication system comprising: a receiver to receive positioning information indicative of locations of a repeater, a base station and a subscriber unit of a wireless communication system (See e.g. 130, 120, 124a-124c, 104a-104c, 114a-114c of Fig. 1, Page 2, Paragraphs [0032]-[0035]), and to receive observed information indicative of signals sent from the base station to the subscriber unit through the repeater; and a control unit (See e.g. 120 of Fig. 1, 1630 of Fig. 16, 1710 of Fig. 17) to calculate a repeater delay for signals sent from the base station to the subscriber unit through the repeater based on the positioning information (See e.g. Page 5, Paragraphs [0064]-[0065]), and the observed information indicative of signals sent from the base station to the subscriber unit through the repeater (See e.g. Page 6, Paragraph [0080]).

Regarding claim 18 Amerga discloses the control unit calculates the repeater delay by identifying a predicted delay based on distances between the base station and the repeater and the repeater and the subscriber unit, identifying an observed delay from the observed information, and calculating the repeater delay as a difference between the observed delay and the predicted delay (See e.g. Page 6, Paragraphs [0076]-[0081]).

Regarding claim 20 Amerga discloses identifying the observed delay includes identifying from the observed information a phase offset (See e.g. Page 2, Paragraph [0036], Page 3, Paragraph [0042]) of pilot symbols relative to system time based on information sent from the subscriber unit indicative of signals sent from the base station to the subscriber unit through the repeater (See e.g. Page 6, Paragraphs [0076]-[0081]).

With respect to claim 21, Amerga discloses computer-readable medium (See e.g. Page 11, Paragraph [0137]) comprising instructions that when executed in a position determination entity (PDE) of a wireless communication system cause the PDE (See e.g. 130 of Fig. 17) to generate position assistance information based on, positioning information indicative of a location of the repeater and information indicative of signals detected by the subscriber unit (See e.g. Page 11, Paragraphs [0135]-[0139]).

Regarding claim 22 Amerga discloses instructions that when executed cause the PDE to send the position assistance information to the subscriber unit (See e.g. Page 9, Paragraph [0108]).

Regarding claim 23 Amerga discloses the position assistance information identifies a set of positioning system satellites that are in view to the subscriber unit (See e.g. 124a-124c of Fig. 1, Page 6, Paragraph [0080]-[0082]).

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Regarding claim 24 Amerga discloses the information indicative of signals detected by the subscriber unit includes phase offsets, wherein the signals are associated with base stations of the wireless communication system (See e.g. Page 2, Paragraph [0036], Page 3, Paragraph [0042]).

With respect to claim 25, Amerga discloses a computer-readable medium comprising instructions that when executed in a device medium (See e.g. Page 11, Paragraph [0137]) of a wireless communication system cause the device to calculate a repeater delay for signals sent from a base station to a subscriber unit through a repeater based at least in part on positioning information associated with the repeater, the base station and the subscriber unit, and observed information indicative of signals sent from the base station to the subscriber unit through the repeater (See e.g. Page 11, Paragraphs [0135]-[0139]).

Regarding claim 26 Amerga discloses identifying a predicted delay based on distances between the base station and the repeater and the subscriber unit; identifying an observed delay from the observed information; and calculating the repeater delay as a difference between the observed delay and the predicted delay (See e.g. Page 6, Paragraphs [0076]-[0081]).

Regarding claim 27 Amerga discloses identifying the observed delay includes identifying from the observed information a phase offset of pilot symbols relative to system time associated with the wireless communication system (See e.g. Page 6, Paragraphs [0076]-[0081]).

With respect to claim 28, Amerga discloses a repeater of a wireless communication system (See e.g. 130, 120, 124a-124c, 104a-104c, 114a-114c of Fig. 1, Page 2, Paragraphs [0032]-[0035]) comprising: means for receiving a signal sent from a first device in the wireless communication system (See e.g. Page 5, Paragraphs [0064]-[0065]); and means for repeating the signal to a second device in the wireless communication system; means for receiving positioning signals; and means for calculating a position of the repeater based on the positioning signals (See e.g. Page 6, Paragraphs [0076]-[0081]).

Regarding claim 29, Amerga discloses means for sending information indicative of the position of the repeater to another device (See e.g. Page 6, Paragraphs [0076]-[0081]).